REMARKS

This Amendment is in response to the Office Action mailed October 24, 2002. In the Office Action, the Examiner rejected claims 1-5, 11-15, 21-25 under 35 U.S.C. §102(e); and claims 6, 10, 16, 20, 26, 30 under 35 U.S.C. §103(a). In addition, the Examiner indicated allowable subject matter for claims 7-9, 17-19, and 27-29 if they are rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants have amended claims 1, 3, 8, 11, 13, 18, 21, 23, and 28 to correct minor informalities and to clarify the claim language. Reconsideration in light of the amendments and remarks made herein is respectfully requested.

I.   DRAWINGS

In the Office Action, the drawings were objected to by the draftsperson as noted in the form PTO 948. Applicants respectfully request postponement in submitting the formal drawings until the pending claims have been allowed.

II.   REJECTION UNDER 35 U.S.C. §102(e)

In the Office Action, the Examiner rejected claims 1-5, 11-15, 21-25 under 35 U.S.C. §102(e) as being anticipated by U.S. Patent No. 6,453,411 issued to Hsu et al. ("Hsu"). Applicants respectfully traverse the rejection for the following reasons.

Hsu discloses a system and method using a hardware embedded run-time optimizer. An instruction cache (Icache) is used to determine which code is hot code. The Icache has a counter and a few bits to hold the branch history information (Hsu, col. 5, lines 19-24). A trace memory holds the traces of the optimized instructions. This trace memory is a portion of RAM memory (Hsu, col. 5, lines 31-33). The trace memory is divided into several chunks. When a chunk is filled up, the next chunk becomes the current chunk. Where there is no chunk available, one of the existing chunks will be evicted (Hsu, col. 7, lines 5-10).

Hsu does not disclose, either expressly or inherently, (1) a cache management logistics to control transfer of a trace, (2) a first cache to evict the trace based on a replacement mechanism; and (3) a second cache to receive the evicted trace based on a first number of accesses to the trace. The Examiner stated that Hsu discloses a cache management logistics to control a transfer of a trace. However, the Examiner does not specifically point out the element in Figure 2 that

App. No. 042390.P10140

performs this control function. Hsu does not disclose transfer of a trace. The Examiner further stated that Hsu discloses a first cache (Fig.1, Ref 105, col. 7, lines 5-12). However, element 105 in Hsu is merely a trace memory, not a cache (Hsu, col. 5, lines 30-33). The Examiner further stated that Hsu discloses a second cache (Fig. 2, Ref 101, col. 5, lines 19-30). However, element 101 in Hsu is merely an instruction cache (Icache). The Icache merely contains optimized instruction for trace execution. The Icache does not receive the trace evicted from the first cache.

Therefore, Applicants believe that independent claims 1, 11, 21 and their respective dependent claims are distinguishable over the cited prior art references. Accordingly, Applicants respectfully request the rejection under 35 U.S.C. §102(e) be withdrawn.

II.   REJECTION UNDER 35 U.S.C. §103(a)

In the Office Action, the Examiner rejected claims 6, 10, 16, 20, 26, and 30 under 35 U.S.C. §103(a) as being unpatentable over Hsu in view of The "Cache Memory Book", 1993, Academic Press, pp. 37-107, by Jim Handy ("Handy"). Applicants respectfully traverse the rejection for the following reasons.

Hsu discloses a hardware/software system for instruction profiling and trace selection using branch history information for branch predictions as discussed above.

Handy discloses a design of a cache memory.

There is no motivation to combine Hsu and Handy because neither of them addresses the problem of trace cache filtering. There is no teaching or suggestion that a cache management logistics to control transfer of a trace, a first cache to evict the trace, and a second cache to receive the evicted trace is present. Hsu and Handy, read as a whole, does not suggest the desirability of filtering a trace cache. For the above reasons, the rejection under 35 U.S.C. §103(a) is improperly made.

Hsu and Handy, taken alone or in any combination, does not disclose, suggest, or render obvious a cache management logistics to control transfer of a trace, a first cache to evict the trace, and a second cache to receive the evicted trace.

Therefore, Applicants believe that independent claims 1, 11, 21 and their respective dependent claims are distinguishable over the cited prior art references. Accordingly, Applicants respectfully request the rejections under 35 U.S.C. §102(e), and 35 U.S.C. §103(a) be withdrawn.

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

The following is a set of all amended.

1   1.   (Amended) An apparatus comprising:

2   a cache management logistics to control a transfer of a trace;

3   a first cache coupled to the cache management logistics to evict the trace based on a

4   replacement mechanism; and

5   a second cache coupled to the cache management logistics to receive the evicted trace

6   based on a first number of accesses to the trace.

1   3.   (Amended) The apparatus of claim 2 further comprising a comparator to compare

2   a first threshold value to the number of accesses to the trace, the first threshold value is being a

3   first fixed number or a first dynamically adjusted number.

1   8.   (Amended) The apparatus of claim 4 wherein the trace is discarded from the

2   second cache when a second threshold value is more than a second number of accesses to the

3   trace, the second threshold value being a fixed number or a dynamically adjusted number.

1   11.   (Amended) A method comprising:

2   controlling a transfer of a trace;

3   evicting the trace based on a replacement mechanism using a first cache; and

4   receiving the evicted trace based on a first number of accesses to the trace using a second

5   cache.

1   13.   (Amended) The method of claim 12 further comprising comparing a first

2   threshold value to the number of accesses to the trace, the first threshold value is being a first

3   fixed number or a first dynamically adjusted number.

1   18.   (Amended) The method of claim 14 further comprising discarding the trace when

2   a second threshold value is more than a second number of accesses to the trace, the second

3   threshold value being a fixed number or a dynamically adjusted number.

1   21.   (Amended) A system comprising:

2   an execution unit; and

3   a cache unit couple to the execution unit to provide the execution unit a trace, the cache

4   unit comprising:

5   a cache management logistics to control a transfer of the trace;

6   a first cache coupled to the cache management logistics to evict the evicted trace based

7   on a replacement mechanism; and

8   a second cache coupled to the cache management logistics to receive the trace based on a

9   first number of accesses to the trace.

1   23.   (Amended) The system of claim 22 further comprising a comparator to compare

2   a first threshold value to the number of accesses to the trace, the first threshold value is being a

3   first fixed number or a first dynamically adjusted number.

1   28.   (Amended) The system of claim 24 wherein the trace is discarded from the

2   second cache when a second threshold value is more than a second number of accesses to the

3   trace, the second threshold value being a fixed number or a dynamically adjusted number.

CONCLUSION

In view of the amendments and remarks made above, it is respectfully submitted that the pending claims are in condition for allowance, and such action is respectfully solicited.

Respectfully submitted,

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App. No. 042390.P10140

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